REMARKS

Claims 1-5, 7-9, 12-18 and 29 are pending with entry of the current amendment. Applicants acknowledge the election of Claims 1-18 and 29 for prosecution, and the withdrawal of Claims 19-24 and 27-28 from consideration.

Claim 1 is amended as discussed further below. Claims 2-5, 7, 12-16 and 18 are amended to conform the claims to U.S. practice. Claims 10-11 are canceled and subject matter incorporated into Claim 1. Applicants respectfully request reconsideration based on the amendment to Claim 1.

Rejection under 35 U.S.C. §112

Claims 1-5, 7-18 and 29 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement, because the energy units in Claim 1 are incorrect. Applicants have amended Claim 1 to correct the units. Withdrawal of the §112 rejection is respectfully requested.

Rejections under 35 U.S.C. §102

Claims 1, 2, 4, 7-13, 15, 17, and 29 are rejected under 35 U.S.C.§102(b) as anticipated by Berneth et al., WO 97/44365. Applicants respectfully traverse this rejection as it may pertain to the amended claims.

Claim 1 is amended to indicate that the surface of the storage medium is modified during the writing process so that a depression of at least 10 nm and a width, measured on the original surface, of less than 10 µm is achieved in one direction. No new matter is added; this language was found in Claims 10-11, now canceled, and is described at various places in the specification: at page 3, lines 6-19 it is described that data is written into the two-dimensional storage medium with the aid of light in the form of local changes in the surface topography of the dye. As described at page 43, lines 16-24 of the specification, a local change in the surface topography is understood to be a depression of at least 10 nm having a width in one direction of less than 10 µm. The changes in the surface topography are produced by the high intensity of the laser light. As further explained on page 45, lines 16-36, a high pulse energy of the light pulses of the writing laser produces a modification in

the surface of the recording material which is not observed at a low pulse energy (cf. also the passage from line 31 on page 40 to line 9 on page 41 of the application).

The writing process according to the present invention can be considered to be quasi-irreversible, since changes in the inscribed surface modifications can only be obtained by heating the layer to a temperature close to the glass transition temperature (cf. lines 10-19 on page 41).

Berneth et al. disclose a different writing process. According to the passage from line 4 on page 4 to line 15 on page 5 the information is inscribed in two steps. First the substrates are irradiated over a large area with a light source suitable for conventional inscription, so that optical anisotropy is obtained. Then the optically pretreated substrates are briefly irradiated with intense light, thereby reducing or completely extinguishing the double refraction. Thus, in the process according to '365, high anisotropy is initially produced over a large area and then systematically reduced or extinguished. According to Berneth et al., information is inscribed in a completely reverse fashion to the writing methods of the present invention.

Thus, the present invention differs from that disclosed in Berneth et al. in the local changes in the surface topography caused by the high energy density of the writing laser. Berneth et al. do not disclose this claim element, and therefore do not anticipate the present invention. Withdrawal of the §102 rejection is respectfully requested.

Rejections under 35 U.S.C. §103

Claims 1, 2, 4, 7-13, 15, 17, and 29 are rejected under 35 U.S.C.§103(a) as obvious and unpatentable over Berneth et al., WO 97/44365; or Berneth et al. in combination with Elmasry '819 and Savant et al., '221 (Claims 1-4, 7-13, 15-18 and 29); or Berneth et al. in combination with Elmasry, Savant, Ninomiya et al. or Akashi et al. (Claims 1-5, 7-18 and 29). Applicants respectfully traverse these rejections as they may pertain to the amended claims.

As explained above, the writing process of Berneth et al. is completely different from the process of the present invention (first by producing anisotropy, followed by the systematic extinction or reduction of anisotropy). Berneth et al. do not provide any suggestions that special writing effects can be obtained by increased pulse energy densities, since increased pulse energy densities which

result in changes in the surface topography would make it impossible to carry out the writing process according to Berneth et al. Thus, one skilled in the art would not be motivated to alter the process of Berneth et al., as this would result in an unworkable process according to that invention.

Regarding the comments in paragraphs 1 and 2, page 4 of the office action, power density is no longer a relevant distinguishing feature.

Savant et al. (US '221) is cited for the disclosure of a reflective layer, but does not provide the missing teaching, that of surface modification.

Elmasry (US '819) is cited for the disclosure of a modulation means, but also does not provide the missing teaching. Elmasry describes a totally different type of chemistry, namely photochromic systems which produce reading signals via surface modifications. Elmasry describes quite generally the deformation of thermoplastics containing 1 % dye. This deformation is identified in the examples by means of signal differences. It is not clear whether the differences in the signals are merely due to deformation, i.e. surface modifications, or whether some of them are for example produced by irradiation with light. Elmasry does not any suggestion or evidence that the writing mechanism described therein includes surface modification; Elmasry even states that no chemical modification of dyes occurs.

None of the additionally cited references, Ninomiya et al. or Akashi et al., describes the features of the present invention nor, in particular, the special surface modification. Therefore the present invention is not rendered obvious either by the references considered individually, or in combination. Applicants respectfully request withdrawal of all §103 rejections.

RESPONSE TO ADVISORY ACTION

In response to the comments in the Advisory Action, Applicants have additionally amended Claim 1 to indicate the laser beam is focused. Support for this amendment can be found in the specification at page 43, line 32. In the present invention, a focused laser beam is used for the optical writing, and the surface modifications on the polymer are created by a focused laser beam.

In Kim et al. and Hvilsted (Macromolecules and Optic Letters) holographic surface reliefs are created by holographic recording (see, e.g., Hvilsted, Optic

Letters, lines 10-13; Hvilsted, Macromolecules, page 2173, last paragraph on right column; and Kim, Side-chain liquid-crystalline polyesters for optical information storage). The holographic gratings were recorded by an interferometric apparatus (see Kim, page 1166, right column, lines 10/11).

Holographic means that an interference pattern is produced by bringing two laser beams to overlap. The light pattern thus produced causes an area exposure resulting in a line structure of the recorded area. In contrast, the focused laser beam used according to the present invention produces a circular pattern, a so-called hole or a crater-like pattern. Thus, the method of exposure in the cited references differs from that of the present invention. Accordingly, none of the previously cited references, anticipate or render obvious Claim 1, or any claim depending therefrom.

CONCLUSION

Applicants submit that all outstanding issues have been addressed and that Claims 1-5, 7-18 and 29 are in condition for allowance; such action is respectfully requested at an early date.

Respectfully submitted,

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